

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 27

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte KOJI FUKUSHIMA and KEIICHI SAKASHITA

Appeal No. 1997-1221
Application No. 08/299,591

HEARD: Oct. 12, 2000

Before GARRIS, LIEBERMAN, and TIERNEY, Administrative Patent Judges.

GARRIS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal from the final rejection of claims 1, 3 and 4 which are all of the claims pending in the application.

The subject matter on appeal relates to a soundproof heat shield member for an exhaust manifold comprising a metal

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substrate, a nonwoven fabric and a woven wire cloth. Further details of this appealed subject matter, such as the specific dimensions and materials of construction, are set forth in representative independent claim 1 which reads as follows:

1. A soundproof heat shield member for an exhaust manifold, comprising:

a metal substrate formed into a given three-dimensional shape, the metal substrate having a thickness of 0.5-2 mm and selected from a group consisting of steel sheet, plated steel sheet and stainless steel sheet;

a nonwoven fabric disposed on a surface of the metal substrate facing the exhaust manifold, the fabric comprises at least one inorganic fiber selected from a group consisting of ceramic fiber, glass wool, silica fiber and rock wool; and

a woven wire cloth of metal wires with an interstice of 5-100 mesh disposed on a surface of the nonwoven fabric and fixed to the metal substrate, the metal wires selected from a group consisting of stainless steel, brass and galvanized steel and having a wire diameter of 0.1-1 mm.

The references set forth below are relied upon by the examiner as evidence of obviousness:

Thompson et al. (Thompson)	4,166,878	Sep. 4,
1979		
Lim	5,139,839	Aug. 18,
1992		

All of the appealed claims stand rejected under 35 U.S.C.

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§ 103 as being unpatentable over Thompson in view of Lim. On pages 3 through 5 of the answer, the examiner expresses his position as follows:

Thompson et al discloses an insulation material comprising a thin metal sheet, a nonwoven fabric layer disposed on the thin metal sheet, and a wire mesh layer disposed on the nonwoven fabric layer. The nonwoven fabric layer preferably comprises a ceramic fiber. The material is useful as an insulating material. A preferred embodiment employs the material as a replaceable insulation material for use in engines. Thompson et al teaches that the insulation material provides enhanced heat shielding for materials having the insulation disposed thereon, thus allowing less expensive materials, such as carbon steel rather than high temperature nickel based alloyed steel to be used in high heat environments. Thompson et al differs from the claimed invention in that Thompson et al does not specifically teach that the insulating material can be used as an insulation for an exhaust manifold, and because Thompson et al does not teach the specific metals claimed for use as the woven layer and the thin metal sheet, nor the particular diameter of the wire, mesh size of the woven wire, thickness of the metal sheet or bulk density of the nonwoven fabric. Lim teaches an insulating material comprising a fibrous blanket and a protective wire mesh covering over the blanket. The fibrous blanket may comprise ceramic fibers, rock wool and fiber glass, (see column 1, lines 5-14). The wire mesh may comprise steel, (see column 1, lines 64-65). Lim teaches that the insulating material is useful in a wide variety of applications including exhausts, turbo chargers and power generators. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used steel for the heat resisting sheet and the woven wire covering. One of ordinary skill in the

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art would have been motivated to use steel by the teaching of Lim that steel is a heat resistant metal which is useful in insulating blankets and because steel is known in the art to be useful as a heat resistant material. Since Lim teaches that the wire mesh functions as a protective encasement for the nonwoven fibrous material it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the diameter of the wire and the mesh size of the woven wire which produced the optimal strength, while still maintaining the porosity of the mesh. Similarly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the particular thickness of the metal sheet and the bulk density of the nonwoven fabric in order to optimize the desirable properties of the heat shield such as strength and heat insulation, both of which are taught by the references to be related to the thickness of the metal sheet and the bulk density of the nonwoven fabric. It is *prima facie* obvious to optimize a known result effective variable through the process of routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233 (CCPA 1955).

We refer to the brief and reply brief and to the answer for a complete exposition of the opposing viewpoints expressed by the appellants and by the examiner concerning the above noted rejection.

OPINION

Having carefully studied the record before us, we determine that the reference evidence adduced by the examiner fails to establish a prima facie case of obviousness within

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the meaning of 35 U.S.C. § 103. It follows that we cannot sustain the section 103 rejection advanced by the examiner on this appeal. Our reasons are set forth below.

As correctly pointed out by the appellants, neither Thompson nor Lim contains any teaching or suggestion relating to soundproofness which is a characteristic of the here claimed member. That is, the articles or members disclosed by Thompson and Lim are designed to possess certain characteristics such as thermal insulation but not the soundproofness characteristic under consideration. This deficiency of the applied references is pivotally significant.

This is because the examiner's rejection is based upon the proposition that it would have been obvious to combine the reference teachings and to optimize certain variables taught by the references as being result effective in order to thereby obtain an article or member corresponding to the appellants' claimed soundproof heat shield member. For example, as reflected in the aforementioned quotation, the examiner concludes that

it would have been obvious to one of ordinary skill
in the art at the time the invention was made to

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have selected the particular thickness of the metal sheet and the bulk density of the nonwoven fabric in order to optimize the desirable properties of the heat shield such as strength and heat insulation, both of which are taught by the references to be related to the thickness of the metal sheet and the bulk density of the nonwoven fabric

and that "[i]t is *prima facie* obvious to optimize a known result effective variable through the process of routine experimentation" (answer, page 5).

This analysis by the examiner is flawed because it implicitly presupposes, without any evidence or rationale, that

the optimization of variables in accordance with the reference teachings would yield the soundproof heat shield member defined by the independent claim on appeal. The validity of this presupposition clearly is suspect in view of the earlier discussed fact that the appellants' heat shield member is designed to possess a soundproofness characteristic with respect to which the applied references are silent.

Thus, it is simply unknown whether an article corresponding to the here claimed soundproof heat shield member would result from combining and optimizing the

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teachings and variables of the applied references. By way of exemplification, the resulting article might have a metal substrate thickness completely outside the here claimed range upon being optimized to provide thermal insulation when used inside a gas turbine engine pursuant to the teachings of Thompson. Likewise, such optimization might result in a nonwoven fabric having density, thickness and compressibility values far outside the ranges claimed by the appellants.

In summary, it is our view that the examiner's rejection is based upon conjecture, speculation or assumptions in the form of the above discussed presupposition. It is well settled, however, that a rejection based on section 103 must rest upon a factual basis rather than conjecture, speculation or assumptions. In re Warner, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967). As a consequence, we cannot sustain the examiner's section 103 rejection of the appealed claims as being unpatentable over Thompson in view of Lim.

The decision of the examiner is reversed.

REVERSED

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	Bradley R. Garris)	
	Administrative Patent Judge)	
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	Paul Lieberman)	BOARD OF
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